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PRINCIPLES & LAW OF COLORADO'S NONTRIBUTARY GROUND WATER*

INTRODUCTION

In 1964, a legislative committee studying Colorado's nontributary ground water[1] characterized the administration of this resource as being in a state of anarchy.[2] The law governing this type of ground water has since been referred to as inadequate,[3] arcane,[4] and neglected.[5] Criticism culminated in 1979 when uncertainty as to who could remove non-designated ground water resulted in what the Colorado Supreme Court called "one of the great emergencies in the history of Colorado water

* This article was published shortly before Senate Bill 5, 1985 Colo. Sess. Laws, ch. 285, was enacted into law. Whether this legislation, which purports to clarify the confusion surrounding the management of Colorado's ground water, succeeds should be assessed in light of the hydrologic principles and economics of ground water discussed herein. It is the opinion of the author and editors that S.B. 5 fails to achieve its goal of establishing a comprehensive ground water management scheme. Accordingly, this article provides an analytical framework for ascertaining the viability and anticipated efficacy of S.B. 5.

1. As used in this article, there are three classifications of ground water: tributary ground water; nontributary ground water found within designated basins (hereinafter designated ground water); and nontributary ground water found outside of designated basins (hereinafter non-designated ground water).

Tributary ground water is underground water "which can influence the rate or direction" of a natural, or surface, stream. COLO. REV. STAT. § 37-92-103(11) (1973). Such tributary ground water is subject to the doctrine of prior appropriation as are other "natural streams," in accordance with the Colorado Constitution. *See infra* notes 18-20 and accompanying text. However, tributary ground water that takes more than a century to reach or influence a surface stream is considered *de minimis* and is not subject to the constitutional doctrine of prior appropriation. *See* Kuiper v. Lundvall, 187 Colo. 40, 529 P.2d 1328 (1974), *appeal dismissed*, 421 U.S. 996 (1975).

Designated ground water "means that ground water which in its natural course would not be available to and required for the fulfillment of decreed surface rights . . . and which . . . is within the geographic boundaries of a designated ground water basin." COLO. REV. STAT. § 37-90-103(6) (Cum. Supp. 1984). In other words, designated ground water is that underground water which is not tributary to a surface stream, or which is *de minimis*, and is located in a basin which the ground water commission has established as a designated basin. *See infra* notes 35-39 and accompanying text.

Non-designated ground water, like designated ground water, is not needed for decreed surface rights and is not tributary to a surface stream. However, unlike the source of designated ground water, the source of non-designated ground water has not been established as a designated basin. *See infra* notes 47-52 and accompanying text.

As used in this article (exclusive of quoted materials and hydrologic comparisons in Section II, *infra*), the term "ground water" when not modified by an adjective refers to nontributary ground water. The terms "withdrawal" and "removal," describing the extraction of ground water, are used synonomously.

2. COLORADO LEGISLATIVE COUNCIL, WATER PROBLEMS IN COLORADO, Research Publ. No. 93 at 4, 45th Gen. Assembly (November 1964) (quoting Felix L. Sparks, Director, Colorado Water Conservation Board, Minutes of Committee Meeting, October 8, 1964).

3. *Id.*

4. ROCKY MTN. MIN. L. FOUNDATION WATER LAW NEWSLETTER, Vol. XIV, No. 1 at 4 (1981).

5. Carlson, *Has the Doctrine of Appropriation Outlived its Usefulness?*, 19 ROCKY MTN. MIN. L. INST. 529, 552 (1974).

law."[6]

The "great emergency" occurred when the Colorado Supreme Court consolidated a number of water cases wherein several applicants sought adjudication of rights[7] in non-designated ground water located throughout the state.[8] The court referred the consolidated cases to a special water judge.[9] The basic issue in all of the consolidated claims was: What law governs the use of non-designated ground water in Colorado?[10] The special water judge's decision,[11] the Colorado Supreme Court's reversal,[12] and the legislative actions which intervened[13] and followed[14] put an end to five years of litigation and left the law governing the use of non-designated ground water substantively unchanged. Certain questions, however, remain unanswered and, according to *Huston*, require legislative clarification.[15] Whether such clarification requires substantive modification is, in part, the subject of the following survey. It is herein suggested that resolution of this issue requires careful consideration of the principles of ground water which are relevant to the law governing its use.

This article examines the evolution of ground water law in Colorado. The primary focus is upon those characteristics of ground water, both designated and non-designated, which warrant its distinctive treatment in the Colorado appropriation scheme.[16] The article concludes with a discussion of *Huston* and its legislative progeny.[17]

I. BACKGROUND: THE FIRST HUNDRED YEARS OF COLORADO GROUND WATER LAW

A. *The Constitutional Question*

The right to appropriate the waters of Colorado antedates the adoption of the state constitution.[18] Commonly referred to as the doc-

6. Southeastern Colo. Water Conservancy Dist. v. Huston, 197 Colo. 365, 376, 593 P.2d 1347, 1354 (1979). It is suggested here, with the benefit of hindsight, that the "great emergency" was overstated by the court. The substantive law governing the removal of ground water remains as it was in 1973, six years before the "great emergency." *See infra* notes 143-5 and accompanying text.

7. *See infra* note 52 and accompanying text.

8. 197 Colo. at 368, 593 P.2d at 1348.

9. "The chief justice of this court is appointing the same district judge as an additional water judge in each of the seven water divisions of the state. For convenience, he is here called the special water judge." *Id.* at 369, 593 P.2d at 1349. *See infra* note 125 and accompanying text.

10. *See infra* note 128 and accompanying text.

11. Southeastern Colo. Water Conservancy Dist. v. Huston, No. 79 CW 1 (Dist. Ct. Colo. Water Div. 1-7, Feb. 11, 1981) (hereinafter cited as Consolidated Ruling).

12. State v. Southwestern Colo. Water Conservation Dist., 671 P.2d 1294 (Colo. 1983), *cert. denied*, 104 S. Ct. 1929 (1984) (hereinafter cited as *Huston*).

13. *See infra* note 136.

14. *See infra* notes 138-39 and accompanying text.

15. *See infra* note 52 and accompanying text.

16. The appropriation of Colorado's tributary ground water is governed by a separate body of law. *See* COLO. REV. STAT. §§ 37-92-101 to -602 (1973 & Cum. Supp. 1984).

17. *See infra* notes 125-42 and accompanying text.

18. *See* Coffin v. Left Hand Ditch Co., 6 Colo. 443 (1882), in which the court stated:

trine of prior appropriation, the right to divert and apply to beneficial use the unappropriated waters of the state has long been recognized as the most reasonable water use doctrine for Colorado's arid climate.[19] The doctrine was formalized in the state constitution as follows: "The water of every natural stream, not heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of this state, subject to appropriation as hereinafter provided."[20]

The doctrine of prior appropriation has been applied in various forms to surface water in practically all of the western states,[21] including Colorado;[22] however, the doctrine, in its pure form,[23] has not proved workable to govern the removal of ground water.[24] Accordingly, Colorado courts and the legislature have expressly stated that the constitutional provisions for prior appropriation apply only to "natural streams" and waters tributary thereto; thus excluding nontributary ground water from the constitutional appropriation scheme.[25]

Although the argument persists that this limited application of the doctrine was not intended by the drafters of the constitution,[26] the *Hus-*

> It is contended . . . that the common law principles of riparian proprietorship prevailed in Colorado until 1876, and that the doctrine of priority of right to water by priority of appropriation thereof was first recognized and adopted in the constitution. But we think the latter doctrine has existed from the date of the earliest appropriations of water within the boundaries of the state.

Id. at 446. The unadulterated doctrine of prior appropriation as discussed in *Coffin* is beyond the scope of this article. For a discussion of the doctrine as applied in Colorado, see Note, *A Survey of Colorado Water Law*, 47 DEN. L.J. 226 (1970).

19. *Huston*, 671 P.2d at 1304-5. For a discussion of alternative doctrines, such as the absolute ownership, reasonable use, and correlative rights doctrine, as applied to ground water, see Martz, *Who Has the Better Right to Non-tributary Ground Waters in Colorado—Landowner or Appropriator?*, 31 DICTA 20, 22-5 (1954).

20. COLO. CONST. art. XVI, § 5.

21. *See generally* 1 W. HUTCHINS, WATER RIGHTS LAW IN THE NINETEEN WESTERN STATES, 226-650 (1974).

22. *See supra* note 16.

23. In regard to the removal of designated ground water, Colorado Statutes provide a "modified" doctrine of prior appropriation. COLO. REV. STAT. § 37-92-102 (1973 & Cum. Supp. 1984). *See infra* notes 35-46 and accompanying text.

24. Moulder, *Legal and Management Problems Related to the Development of an Artesian Ground Water Reservoir*, United States Geological Survey, Circular 6, Ground-Water Series, at 3 (1962).

25. *Huston*, 671 P.2d 1294 (Colo. 1983), *cert. denied*, 104 S. Ct. 1929 (1984); Kuiper v. Lundvall, 187 Colo. 40, 529 P.2d 1328 (1974), *appeal dismissed*, 421 U.S. 996 (1975); Whitten v. Coit, 153 Colo. 157, 385 P.2d 131 (1963). *See also* COLO. REV. STAT. § 37-82-101 (Cum. Supp. 1984) wherein it is stated:

> The waters of natural streams of Colorado do not include underground waters not in or tributary to natural surface streams nor underground waters which, when withdrawn, do not impair the flow of natural surface streams. All waters not in or tributary to a natural stream . . . shall be subject to such administration and use as the general assembly may provide by law.

26. *See, e.g.*, Consolidated Ruling, *supra* note 11, at 39. The special water judge concludes that the drafters of the state constitution "intended *subjectively*" (emphasis as it appears) that ground water was encompassed by the constitutional reference to waters "of every natural stream," and, accordingly, that all ground water is subject to appropriation. The special water judge premised this conclusion on the "limited technical knowledge" available to the drafters which prevented their distinguishing between tributary and nontributary ground water. *Id. But see* Roath v. Driscoll, 20 Conn. 532, 541 (1850) (wherein

ton court's rejection of this contention signals a continuing unwillingness to break with long established precedent.[27] Thus, the law governing the administration of Colorado's nontributary ground water has been left to the general assembly.[28]

B. *Statutory Guidance: The Colorado Ground Water Management Act of 1965*[29]

Notwithstanding the recognized importance and value of Colorado ground water,[30] the law governing this resource has been slow to develop.[31] It was not until the 1930's that hydraulic technology made possible the large scale withdrawal of ground water for irrigation. With improved technology, notably the development of irrigation pumps and rural electrification, came increasing demands for use of the state's ground water.[32] The general assembly, however, acted only sparingly with regard to the administration and withdrawal of ground water resources,[33] and until 1965 failed to distinguish between tributary and nontributary ground water in legislation on the subject.[34]

The Management Act finally established a regulatory scheme for the removal of ground water found within certain administratively specified "designated basins."[35] The Management Act provided for the designa-

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the distinction between tributary and nontributary ground water is clearly recognized and stated: "Water, whether moving or motionless, in the earth . . . .").

27. *See supra* note 25 and accompanying text.

28. *See* COLO. REV. STAT. § 37-82-101 (Cum. Supp. 1984).

29. COLO. REV. STAT. §§ 37-90-101 to 141 (1973 & Cum. Supp. 1984) [hereinafter Management Act].

30. Ground water reservoirs probably hold several times as much useable water as the combined capacities of all lakes and surface waters. Address by Thomas M. Stetson, Engineering Consultant to the Department of Justice, State of California, 4th Annual Summer Natural Resources Law Short Course, Natural Resources Law Center, University of Colorado School of Law (June 6-9, 1983). *See also* H.E. THOMAS, THE CONSERVATION OF GROUND WATER (1951). Today, the value of water rights often represents more than 80 percent of the value of a real estate parcel. COLORADO LEGISLATIVE COUNCIL, RECOMMENDATIONS FOR 1982 COMMITTEES ON: AGRICULTURE AND NATURAL RESOURCES, Research Publ. No. 262, at 5, 52nd Gen. Assembly (December 1981). The legal right to any reliable source of water in Colorado has recently been estimated to be worth between $1,000 and $6,000 per acre-foot. The Denver Post, April 17, 1984, at 1, col. 8.

31. *See Huston*, 671 P.2d at 1311. "The subject of withdrawal of nontributary water by wells has been characterized as the 'neglected stepchild' of our water law." *Id.* at 1313 n.30 (quoting Carlson, *supra* note 5).

32. *See generally* Hamsburger, Deltjen & Fisher, *Ground Water: From Windmills to Comprehensive Public Management*, 52 NEB. L. REV. 179, 188-92 (1973); Martz, *Who Has the Better Right to Non-tributary Ground Waters in Colorado—Landowner or Appropriator?*, 31 DICTA 20 (1954).

33. *Huston*, 671 P.2d at 1311.

34. *Id.* at 1311-12. *But see* COLO. REV. STAT. § 148-18-5 (1963) (wherein the legislature provided the first well registration requirements). COLO. REV. STAT. § 148-18-7 (1963), enacted in 1957, expressly distinguished a well permit from a "water right" as follows: "A permit shall not have the effect of granting or conferring a ground water right upon the user nor shall anything in this article be so construed."

35. *Compare* COLO. REV. STAT. §§ 37-90-101 to -141 (1973 & Cum. Supp. 1984) *with* Moulder, *supra* note 24. (In a paper presented at the National Meeting of the American Association for the Advancement of Science, Edward A. Moulder, of the United States Geological Survey, outlined the scheme which was, in large part, incorporated into the Management Act four years later.).

tion of ground water basins throughout the state[36] by the Colorado Ground Water Commission.[37] Once a basin is designated, priority of appropriation is determined through a tentative user priority list, compiled by the commission soon after the basin is designated.[38] Tentative users and objectors are given notice and an opportunity to be heard before the tentative list is made permanent.[39]

Priority dates are determined and permits are issued after applicants specify, among other things: the beneficial use to which the water will be applied;[40] the name of the owner of the land on which the well is to be located;[41] the amount of water to be applied;[42] and, the proposed pumping rate.[43] All claims based on actual taking of ground water prior to May 17, 1965 are determined by an application of the doctrine of prior appropriation. Priorities relate back to the date of the initial beneficial use of the ground water.[44] Claims initiated after May 17, 1965 relate back to the date of the filing of an application with the Ground Water Commission.[45] Thus the regulatory scheme for the removal of ground water is considered a "modified" doctrine of appropriation.[46]

While the Management Act, as originally enacted, prescribed a detailed management system for designated ground water, it was not until 1973 that the Act was amended to include regulations governing the removal of non-designated ground water, and therein only brief mention was made as to how non-designated ground water was to be appropriated.[47] Claims to non-designated ground water lay at the heart of the issues addressed and decided in the Consolidated Ruling and *Huston*.

Following *Huston* and the legislative responses thereto, the law governing the withdrawal of Colorado's non-designated ground water remains to be found in the 1973 amendment to the Management Act.[48] The 1973 amendments provided that the state engineer[49] may issue a permit to construct a well outside designated areas subject to provisions similar to those governing the withdrawal of designated ground water.[50] Additionally it is required that the desired water be appropriated only by

36. COLO. REV. STAT. § 37-90-106 (1973 & Cum. Supp. 1984).
37. COLO. REV. STAT. § 37-90-104 (1973 & Cum. Supp. 1984).
38. COLO. REV. STAT. § 37-90-109 (1973 & Cum. Supp. 1984).
39. *Id.*
40. COLO. REV. STAT. §§ 37-90-108 to -109 (1973 & Cum. Supp. 1984).
41. *Id.*
42. *Id.*
43. *Id.*
44. COLO. REV. STAT. § 37-90-109(1) (1973).
45. COLO. REV. STAT. § 37-90-109(1) (1973).
46. COLO. REV. STAT. § 37-90-102 (1973). The principles of the doctrine of prior appropriation as applied to designated ground water are modified only by the requirement that reasonable water pumping levels are to be maintained. Danielson v. Kerbs AG, Inc., 646 P.2d 363, 370-1 (Colo. 1982).
47. *See* COLO. REV. STAT. § 37-90-137(4) (1973 & Cum. Supp. 1984).
48. *Id. See infra* notes 138-39 and accompanying text.
49. The state engineer is ex officio the executive director of the ground water commission and is charged with enforcing "the decisions, orders, and policies of the commission." COLO. REV. STAT. § 37-90-104(6) (1973).
50. *See supra* notes 40-43 and accompanying text.

the owner of the overlying land or with his consent.[51] Although a "permit" may be issued subject to these provisions, the determination of actual "water rights" is deferred until after such time as a designated basin is established.[52]

II. The Principles of Ground Water

To better understand the statutory distinctions found in the respective Colorado water laws,[53] it is useful to examine the hydrologic differences which form the context in which legislation on the subject is drafted. Generally, nontributary water—specifically nontributary ground water—is distinguished from tributary water[54] in three respects: hydrologically, economically, and politically.[55]

A. *The Hydrology of Ground Water*

Tributary waters are annually replenished. Nontributary ground water is subject to eventual depletion. When the withdrawal rate from a ground water basin exceeds the recharge rate, a "mining condition" develops.[56] "Mining" ultimately lowers the ground water table to a level from which withdrawal is no longer economically efficient.[57] Statutory recognition of this fundamental hydrologic difference is evidenced in the Legislative Declaration[58] of the Management Act. Therein the doctrine of prior appropriation is "modified" to "permit full economic development of the designated ground water resources."[59]

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51. Colo. Rev. Stat. § 37-90-137(4) (1973). *Cf.* Colo. Rev. Stat. § 37-90-109(4)(c) (Cum. Supp. 1983) (wherein applicants for designated ground water must only provide the name of the overlying landowner). *See infra* note 52.

52. Because the determination of "water rights" is not involved in the issuance of a well permit for non-designated ground water, the state engineer need not adopt any rules or regulations to assist in the granting or denial of such permits. *See* Colo. Rev. Stat. § 37-90-137(4) (1973).

It has been suggested that requiring the establishment of a designated basin prior to the adjudication of water rights thereto was a "purposeful legislative decision" which ensured that sufficient information was available before priorities were granted. Brief for Appellant, State of Colorado, at 47, *Huston*, 671 P.2d 1294 (Colo. 1983). *See also* Gardner v. State, 614 P.2d 357, 361 (Colo. 1980).

The question of how to resolve potential conflicts between "permits" and "water rights" is as yet unanswered. In this regard, the *Huston* Court commented: "The subject of judicial recognition of rights to nontributary water outside designated basins and the principles to be applied in establishing the rights of users and adjustment of conflicts among users might benefit from further legislative attention." *Huston*, 671 P.2d at 1313 n.27.

53. *See supra* note 1.

54. As used here, the term "tributary water" encompasses both surface and underground tributary water.

55. For purposes of this Section II, "political" means "of or pertaining to exercise of rights and privileges or the influence by which individuals of a state seek to determine or control its public policy . . . ." Black's Law Dictionary 1042 (5th ed. 1979).

56. Fundingsland v. Colorado Ground Water Comm'n, 171 Colo. 487, 496, 468 P.2d 835, 839 (1970).

57. *See infra* notes 101-107 and accompanying text.

58. Colo. Rev. Stat. § 37-90-102 (1973).

59. *Id. See also* Colorado Legislative Council, *supra* note 2, at 2. The Legislative Council, in a report to the General Assembly prior to passage of the Management Act, suggested that water laws which fail to distinguish tributary waters from nontributary wa-

The specific hydrologic characteristics of legislative concern relate to ground water pressure levels and recharge rates. First, whereas tributary water can be simply diverted or "controlled in its natural course,"[60] nontributary ground water must be pumped; thus the maintenance of natural pressure within a ground water basin is of paramount concern.[61] Second, whereas high recharge rates and rapid transmissivity serve to prevent long range harm from over-appropriations in tributary systems, nontributary ground water lacks this self-adjusting feature.[62]

I. THE PRESSURE PROBLEM

Water pressure is generally of greater concern to those administering and using ground water than is water quantity. Notwithstanding the large storage capacities of certain aquifers,[63] withdrawal is limited by the amount of pressure available since the ground water must often be lifted hundreds of feet to the surface.[64]

Basically it is this "pressure problem" that prevents strict adherence to the doctrine of prior appropriation in regulating the withdrawal of ground water. In a surface system, a senior appropriator's rights are adequately protected by curtailing, in times of shortages, diversions by junior appropriators.[65] This administrative procedure, however, proved unworkable to protect the priorities[66] of senior ground water appropriators. In *Whitten v. Coit*,[67] the Colorado Supreme Court rhetorically explained the unsuitability of the prior appropriation doctrine vis-a-vis ground water as follows:

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ters "pose many problems to water users and to those concerned with the optimum beneficial use of nontributary ground water." *Id.*

60. COLO. REV. STAT. § 37-92-103(7) (1973):

> "Diversion" or "divert" means removing water from its natural course or location, or controlling water in its natural course or location, by means of a ditch, canal, flume, reservoir, bypass, pipeline, conduit, well, pump, or other structure or devise.

Although "diversion" as statutorily defined includes wells and pumps as means thereof, the respective processes of diverting surface water and pumping nontributary ground water are clearly different. The former "intercepts" or changes the direction of a flow into a headgate or ditch. The latter "mines"; since nontributary water is effectively directionless, no "interception" or change of direction is effected. *See* Consolidated Ruling, *supra* note 11, at 7.

61. *See infra* notes 63-84 and accompanying text.

62. *See infra* notes 86-90 and accompanying text.

63. *E.g.*, The Laramie and Fox Hills formation, located within the Lost Creek Ground Water Basin, has an estimated 3,000,000 acre-feet of ground water in storage; however, only 27,000 acre-feet was deemed recoverable when the basin was designated in 1968. Before the Ground Water Commission of the State of Colorado, In the Matter of the Determination of a Designated Ground Water Basin in the Lost Creek Basin of the State of Colorado (May 1, 1968).

64. Whitten v. Coit, 153 Colo. 157, 169, 385 P.2d 131, 138 (1963).

65. *Huston*, 671 P.2d at 1313.

66. Currently there is no judicial recognition of "rights" in non-designated ground water, *see supra* note 52; therefore, as used hereunder, "rights" to non-designated ground water means only those withdrawal privileges conferred upon permittees by the state engineer pursuant to COLO. REV. STAT. § 37-90-137 (1973 & Cum. Supp. 1984). *See supra* notes 50-52 and accompanying text.

67. 153 Colo. 157, 385 P.2d 131 (1963).

> Assume that the most junior well is many miles from the most senior and the intermediate well is close to the senior. The intermediate well has a greater effect on the senior in a shorter period of time, but ultimately and irretrievably the junior well will have an effect on both the intermediate and the senior well. Question: If "appropriation" doctrine is to be applied, which well should be restricted in order to protect the senior?[68]

The question posed by the *Whitten* court quickly received a legislative response through the enactment of the Management Act. The Management Act, as previously discussed,[69] generally empowered the Ground Water Commission to impose withdrawal limitations "as necessary to protect prior appropriators."[70] This power is broadly conferred and, with few limitations,[71] leaves great discretion to the Commission in the selection of measures to effectuate the legislative policy protecting senior appropriators.

To date, the Ground Water Commission has adopted a preventative approach by seeking to avoid, rather than administer, the potential problems posed by the *Whitten* court.[72] One such preventative measure, adopted pursuant to the Commission's discretionary powers, received judicial approval in *Fundingsland v. Colorado Ground Water Commission*.[73]

At issue in *Fundingsland* was denial by the Ground Water Commission of a well permit application for property located in the Northern High Plains Ground Water Basin.[74] The denial was based on a so-called "three mile test." The test is designed to assess the effect of proposed use on nearby appropriators.[75] Based in part on policy, fact, and theory,[76] the test requires an imaginary circle with a three mile radius be

68. *Id.* at 170, 385 P.2d at 138. *See also* Moulder, *supra* note 24, at 7 (wherein it is suggested that a system of curtailing junior users to protect seniors in ground water basins would result in a junior user being prevented from withdrawing water and the senior not obtaining any additional water "until it was too late to be of any benefit.").

69. *See supra* notes 35-52 and accompanying text.

70. COLO. REV. STAT. § 37-90-11 (1973 & Cum. Supp. 1984). The Ground Water Commission is to protect prior appropriators by: limiting or prohibiting withdrawals; establishing reasonable pumping levels; regulating replacement or substitution wells; and ensuring that water is applied to a beneficial use. *Id.*

71. *E.g.*, the Commission shall not issue permits which will unreasonably affect prior water rights in designated basins. COLO. REV. STAT. § 37-90-111(b) (1973). The Commission must confer with local management districts, *see infra* notes 101-4 and accompanying text, before issuing permits or promulgating regulations which would affect those districts. COLO. REV. STAT. § 37-90-111(d) (1973). Notice and hearing provisions must be complied with. COLO. REV. STAT. §§ 37-90-112 (1973) and 37-90-113 (1973 & Cum. Supp. 1984), respectively.

72. *See supra* note 68 and accompanying text.

73. 171 Colo. 487, 468 P.2d 835 (1970).

74. The Northern High Plains Ground Water Basin was established as a designated basin in May, 1967. At that time the Ground Water Commission determined that the basin held 1,066,000 acre-feet of ground water. Annual recharge rate was estimated at 8,000 acre-feet. Projected annual withdrawal rates were: 12,000 acre-feet in 1966; 18,500 acre-feet in 1976; 10,000 acre-feet in 1986; and 5,500 acre-feet for thirty years thereafter. Before the Ground Water Commission of the State of Colorado, In the Matter of the Determination of a Designated Ground Water Basin (May 1967).

75. *Fundingsland*, 171 Colo. at 491, 468 P.2d at 836.

76. *Id. See also* Thompson v. Colorado Ground Water Comm'n, 184 Colo. 489, 575 P.2d 372 (1978).

drawn around a proposed well site. The boundaries of this area theoretically determine which existing appropriators will be affected by the proposed use.[77] If it is determined that a rate of pumping currently exits, or will exist if the proposed well is allowed to become operational, which will exceed a 40 percent depletion of available ground water located in the circle within 25 years, new permit applications will be denied.[78] It is the natural pressure contained in a basin or aquifer[79] which in large part determines the amount of water "available" as used in the three mile test.[80] Thus, consideration of the hydrologic characteristics of non-tributary ground water was fundamental to the development of the ground water management system approved in *Fundingsland.*

The "pressure problem" is of additional concern and further illustrates nontributary ground water's distinctive hydrology because only a small amount of nontributary ground water can be withdrawn from a single point within the ground water system. Large quantities of tributary waters or "natural streams," on the other hand, can be diverted at a single point.[81] This distinction raises questions concerning the right to condemn rights-of-way for well sites, and must be considered in the formulation of a ground water management system. Whereas the Colorado Constitution guarantees the right to divert surface waters[82] and the right to condemn a right-of-way for such diversion,[83] no state constitutional guarantee provides a right to condemn land to construct a well or excavate on private real property.[84]

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77. *Id.*

78. *Id.*

79. " 'Aquifer' means a formation, group of formations, or part of a formation containing sufficient saturated permeable material that could yield a sufficient quantity of water that may be extracted and applied to a beneficial use." COLO. REV. STAT. § 37-90-103(2) (1973).

80. The Ground Water Commission implemented the three-mile test, in *Fundingsland,* in order to ascertain whether the proposed use would impair existing uses by lowering the water level to a point at which pumping costs would no longer be economic. *See* COLO. REV. STAT. § 37-90-107(5) (1973).

81. *See supra* note 60 and accompanying text.

82. COLO. CONST. art. XVI, § 5, *supra* note 20.

83. COLO. CONST. art. XVI, § 7: "All persons shall have a right-of-way across private lands for the construction of ditches, canals, and flumes for conveying water."

84. Although, as already mentioned, "diversion" as statutorily defined includes withdrawal by wells, *see supra* note 61, the constitution provides no right-of-way across private lands for the construction of a well. *Compare supra* note 83 *with* statutes governing the condemnation of rights-of-way which provide only that appropriators are entitled to rights-of-way "which lie between the point of diversion and point of use or proposed use for the purpose of transporting water for beneficial use." COLO. REV. STAT. § 37-86-102 (1973). The issue as to whether the above-quoted statute encompasses the construction of wells has not yet been judicially answered. *But see* Bubb v. Christiansen, 200 Colo. 21, 610 P.2d 1343 (1980). Therein, Justice Lohr stated that the right of condemnation for rights-of-way is "not dependent upon whether the source of supply (of water) is characterized as a well or a spring." However, the decision is expressly limited to the facts of that case, namely: a trespass had already "peacefully" occurred and condemnation proceedings were in progress; the landowner had no development of his own; and, it was determined that the water source was a "spring" and not a well. Moreover, Justice Lohr expressly excludes any determination of a right to trespass in order to initiate a water right. 610 P.2d at 1346-47.

2. Recharge and Transmissivity[85]

The amount of water in a tributary system, often referred to as the "surface flow" in connection with surface waters, can be controlled by curtailing diversions by junior appropriators.[86] In the event of periodic over-appropriations, it has been stated that "no long range harm" is occasioned "since the streams are subject to seasonal recharge."[87] Nontributary ground water, however, does not enjoy the luxury of seasonal recharge,[88] overdrafts inevitably result in premature and long-term reduction of the water table. As the water table drops, pumping lifts and costs become greater.[89] Accordingly, if withdrawals are not administratively controlled, the legislative policy of "full economic development,"[90] as declared in the Management Act, is compromised.

It has been suggested that the characteristics of ground water do not lend themselves to even a "modified" appropriation scheme and, accordingly, that uncontrolled development would result in near optimum use.[91] The prevailing opinion, however, is that the non-replenishing nature and other hydrologic characteristics of Colorado's nontributary ground water warrant special controls and distinctive regulatory treatment.[92]

B. *The Economics and Politics of Ground Water*

In any basin where a mining condition exists, two problems arise: (1) how to extend the water supply to obtain economic stability; and (2) how to allocate equitably the depleting supply of water.[93] The first question involves consideration of how long the water supply must last in order to maximize efficient economic withdrawal for the appropriating community. Hence, the first question is subject to engineering and economic analysis. The second is political in nature.

85. The low transmissivity, or rate of movement, of nontributary ground water is both a cause and effect of a basin's recharge rate; therefore "transmissivity" and "recharge" are interdependent, and as used hereunder are effectively synonomous.

86. *See supra* note 65.

87. Fundingsland v. Colorado Ground Water Comm'n, 171 Colo. 487, 496, 468 P.2d 835, 839 (1970).

88. *Id.* "Due to the slow rate at which underground waters flow through and into the aquifers, it may be many years before a reasonable water level may be restored to a mined aquifer." *Id.*

89. Ten years ago energy costs for pumping ground water were about one to two dollars per acre-foot. Today they are six to ten dollars per acre-foot depending upon the source of the energy. Stetson, *supra* note 30.

90. COLO. REV. STAT. § 37-90-102 (1973).

91. *See, e.g.*, Moulder, *supra* note 24, at 6. This suggestion presupposes several facts and opinions which are subject to dispute, namely: (1) that the most beneficial uses of ground water will be made by those who can afford to pay the most for its withdrawal; (2) that available ground water is naturally located to serve the most beneficial needs; and (3) that priorities should be accorded those most favorably situated in the particular basin. *Id.*

92. *See generally Huston*, 671 P.2d 1294 (Colo. 1983); Fundingsland v. Colorado Ground Water Comm'n, 171 Colo. 487, 468 P.2d 835 (1970).

93. COLORADO LEGISLATIVE COUNCIL, *supra* note 2, at 18.

1. The Economics

Some ground water users responded to the Management Act with trepidation. They feared that their economic well being, and that of the state as well, "would ultimately suffer severe damage."[94] Substantial investments in wells and pumping equipment and, more importantly, the right to withdraw ground water, were all believed to be in jeopardy.[95] These apprehensions were largely the result of rumors,[96] legislative oversights,[97] and the widely held belief that ground water was owned as property by the overlying landowner.[98] Rumors were quelled and oversights corrected;[99] however, the property concerns remained.[100]

Responding to these concerns, the general assembly, in the Management Act, provided for the formation of local management districts.[101] The districts, in concert with the Ground Water Commission,[102] are empowered to "develop comprehensive plans" for the efficient use of designated ground water within each district.[103] It is through these comprehensive plans, formulated primarily at the local level, that the desired "economic stability"[104] is sought to be obtained.

Factors considered by a management district in the development of a water use plan include hydrological data, such as yield and recharge values for each locality.[105] Various economic factors are also considered. For example, the selection of the 25-year limitation period for a 40 percent depletion, which was litigated in *Fundingsland*,[106] was partly based on a finding that construction loans for wells and pumping facilities are amortized over a 25-year period.[107]

94. COLORADO LEGISLATIVE COUNCIL, *Implementation of 1965 Water Legislation*, Research Publ. No. 114, at xvi (December 1966). Ground water users also suggested that the state was losing new additions to its economy since farmers and industries needed assurances of available water supplies in the future. COLORADO LEGISLATIVE COUNCIL, *supra* note 2, at 19.

95. *Id.*

96. *Id.* One of the first problems resulted from rumors that it would take the state engineer two to three years to issue permits.

97. The Management Act, as signed into law (S.B. 367) contained no provisions for replacement wells and no recognition of wells in existence at the time the Act was passed.

98. *See infra* notes 117-20 and accompanying text.

99. The statutes were amended to empower the Ground Water Commission to issue permits for replacement and substitute wells by virtue of original appropriations. COLO. REV. STAT. § 37-90-111(c) (1973).

100. *See infra* notes 121-24 and accompanying text.

101. COLO. REV. STAT. §§ 37-90-118 to -135 (1973 & Cum. Supp. 1984).

102. COLO. REV. STAT. § 37-90-130(1) (1973). *See also* COLO. REV. STAT. § 37-90-111(1) (Cum. Supp. 1984).

103. COLO. REV. STAT. § 37-90-130(2) (1973).

104. It was suggested that the premature development of comprehensive plans and the conferring of water rights before a basin is designated could deprive local water users of participation and representation through their respective management districts. Brief for Appellant, State of Colorado at 50, *Huston*, 671 P.2d 1294 (Colo. 1983).

105. *See* Thompson v. Colorado Ground Water Comm'n, 194 Colo. 489, 499, 575 P.2d 372, 380 (1978).

106. 171 Colo. 487, 468 P.2d 835 (1970).

107. *Id.* at 492, 468 P.2d at 837.

Notice and hearing provisions in the Management Act[108] ensure an opportunity for members of the user community to participate in the development of comprehensive plans.[109] Thus, it is intended that those who depend most on the designated ground water determine their own requirements for "economic stability" and develop a compatible withdrawal plan.[110]

2. The Politics

The right given tax-paying electors to create local management districts[111] and to elect a district's board of directors[112] evidences the legislature's response to the political question; namely, how is the diminishing supply of ground water to be equitably allocated?[113] Locally based decision-making reflects the strong ties of ground water to private property.[114] These ties have been the subject of law review articles[115] and Colorado Supreme Court decisions,[116] including *Huston*.

In *Huston*, proponents of the private ownership theory who sought rights to non-designated ground water relied on two arguments to support their position. First, they argued that ground water was not severed from the land when the federal government patented land to private owners.[117] Second, an argument was based on language found in *Whitten v. Coit*[118] wherein the Colorado Supreme Court cited with approval a law review article which stated that "(t)he landowner has property in the water in his soil."[119] The *Huston* court rejected both of these arguments.[120]

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108. COLO. REV. STAT. § 37-90-131 (1973 & Cum. Supp. 1984).

109. *Id.*

110. *See generally* North Kiowa-Bijou Mgt. Dist. v. Ground Water Comm'n., 180 Colo. 314, 317-18, 505 P.2d 377, 380-81 (1973) (District has power to limit exportation of ground water outside the district). *Cf.* COLO. REV. STAT. § 37-90-137 (1973 & Cum. Supp. 1984) (wherein it is provided that the state engineer need not adopt rules or regulations for granting or denying well permits to non-designated ground water and for the administration of this underground water).

111. COLO. REV. STAT. §§ 37-90-119 to -124 (1973 & Cum. Supp. 1984).

112. COLO. REV. STAT. §§ 37-90-121 to -127 (1973).

113. *See supra* note 93 and accompanying text.

114. This is not to suggest that any of Colorado's water, whether surface or ground water, is susceptible of private ownership. It merely recognizes that the private ownership theory has received judicial attention and has been the subject of extensive law review commentary.

115. *See* Hannay, *Recent Developments in Colorado Groundwater Law*, 58 DEN. L.J. 801 (1981); McHendrie, *The Law of Underground Waters*, 13 ROCKY MTN. L. REV. 1 (1940); Martz, *Who Has the Better Right to Non-tributary Ground Waters in Colorado—Landowner or Appropriator?*, 31 DICTA 20 (1954); Note, *A Survey of Colorado Water Law*, 47 DEN. L.J. 226 (1970).

116. *See Huston*, 671 P.2d 1294 (Colo. 1983); Whitten v. Coit, 153 Colo. 157, 385 P.2d 131 (1963); Safranek v. Town of Limon, 123 Colo. 330, 228 P.2d 975 (1951); McClellan v. Hurdle, 3 Colo. App. 430, 33 P. 280 (1893).

117. *Huston*, 671 P.2d at 1304-07.

118. 153 Colo. 157, 385 P.2d 131 (1963).

119. *Id.* at 174, 385 P.2d at 140.

120. The court addressed the first argument by reference to the Desert Land Act of 1877 and its grant of broad authority to the states to adopt their own water use systems "in accordance with the needs of its citizens." 671 P.2d at 1307. The language upon which the second argument was premised was dismissed as dictum and, to the extent that it recognized a property interest in ground water, it was repudiated. *Id.* at 1317.

Despite repeated rejections of the private ownership theory by the Colorado Supreme Court, the continuing concern for the property right character of ground water is indicated through legislation on the subject. The requirement of land ownership or landowner consent as a prerequisite to ground water withdrawal[121] or well construction[122] is perhaps the most striking example of this recognition of quasi-property rights. Other examples are found in the numerous statutory provisions creating and defining the powers of management districts,[123] and ensuring notice and hearing opportunities for the user community.[124]

III. *HUSTON*

In 1978, lawyer-geologist John Huston of Denver filed applications in water courts[125] across Colorado for the appropriation of nearly 1.3 million acre-feet of non-designated ground water.[126] Huston's claims, based on the doctrine of prior appropriation, were consolidated with other claims based on other theories such as the private ownership theory previously discussed.[127] Common issues of law were submitted to the special water judge for resolution.[128]

Huston argued that the constitutional references to "natural streams" encompass all natural water in the state and, accordingly, non-designated ground water is subject to the doctrine of prior appropriation.[129] These arguments were accepted by the special water judge who found "no distinction" between designated and non-designated ground waters.[130] He ruled that non-designated ground water, like designated ground water,[131] was subject to appropriation.[132]

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121. *See supra* note 51 and accompanying text.

122. *See supra* note 82-4 and accompanying text.

123. *See supra* notes 101-4 and accompanying text.

124. *See supra* note 39 and accompanying text.

125. The term "water court" is a common reference to the district courts of all counties situated within a particular water division, acting collectively through a water judge. *See* COLO. REV. STAT. § 37-92-203(1) (Cum. Supp. 1984). There are seven water divisions within the state. *See* COLO. REV. STAT. § 37-92-201 (1973).

126. The Denver Post, April 17, 1984, at 1, col. 8.

127. *See, e.g., supra* notes 117-120 and accompanying text.

128. Five specific questions were assigned to the special water judge:

> Q1. Whether non-tributary (sic) waters in Colorado are subject to appropriation; and, in the event that the answer to this question is in the affirmative, for the determination of the following additional questions of law;
>
> Q2. By what authority can such waters be appropriated?
>
> Q3. Can non-tributary waters outside the boundaries of designated ground water basins be appropriated by persons having no property interest in the surface?
>
> Q4. Can non-tributary waters outside the boundaries of designated ground water basins be appropriated by persons other than the claimant or those whom the claimant represents?
>
> Q5. Can applications for non-tributary waters outside the boundaries of designated ground water basins be filed (a) without first obtaining permits from the state engineer and, if so, (b) without first applying for such permits?

Huston, 671 P.2d at 1302-3.

129. Consolidated Ruling, *supra* note 11, at 39.

130. *Id.* at 13.

131. *See supra* note 46 and accompanying text.

Four years and over 200 intervenors later,[133] the Colorado Supreme Court reversed the special water judge. Specifically, it was held that non-designated ground water is not subject to appropriation.[134] Therefore, rights to non-designated ground water were properly obtainable through the state engineer, not the water courts.[135] Moreover, the district courts had jurisdiction over review of the state engineer's actions, not the water court.[136] Pursuant to this holding, Huston's applications and those of other applicants were remanded to the water courts, and the water judges were directed to dismiss all claims to non-designated ground water.[137]

The *Huston* decision was quickly followed by the enactment of legislation which placed the determination of "rights" to non-designated ground water in the exclusive jurisdiction of the water court.[138] Control over the granting of well permits, however, was left with the state engineer.[139]

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132. Consolidated Ruling, *supra* note 11, at 13. For a summary of the rulings by the special water judge on other assigned questions, see *Huston*, 671 P.2d at 1302-03.

133. *See Huston*, 671 P.2d at 1296-1300 (these pages are devoted exclusively to the listings of parties and their respective counsel).

134. *Id.* at 1303. The reversal of this threshold ruling made it unnecessary to consider other rulings by the special water judge. *See supra* notes 128-32 and accompanying text. However, the supreme court did comment on the special water judge's ruling that applications for non-designated ground water could be filed in the water court. The supreme court held that "[c]ontrary to the ruling of the special water judge, . . . the only statutory means available for obtaining rights" to non-designated ground water "is application for a well permit from the state engineer. . . ." 671 P.2d at 1320.

135. *Id.* at 1320.

136. The question as to the proper forum in which to appeal the state engineer's actions in the granting or denial of a well permit (to non-designated water) was considered by the Colorado Supreme Court under dubious conditions. The statute which provided for appellate procedures, COLO. REV. STAT. § 37-90-115 (1973), was repealed and reenacted subsequent to the ruling by the special water judge and prior to the rendering of a decision by the Colorado Supreme Court. Whereas the statute, before the 1983 revision, provided for review of actions by the state engineer (in granting or denying well permits) in district court, the revised statute is silent on the subject. *See* COLO. REV. STAT. § 37-90-115 (1973 & Cum. Supp. 1984) (as amended, 1983 Colo. Sess. Laws ch. 409, at 1416 (H.B. 1310)).

The Colorado Supreme Court ruled that the statute, before revision, provided for review in the district court. The ruling, however, was arguably a moot point, as the court refused to express an opinion on procedures for the review of a state engineer's action after the statutory revision. 671 P.2d at 1314-15.

137. 671 P.2d at 1323.

138. Senate Bill No. 439, as signed into law on October 11, 1983, amended COLO. REV. STAT. § 37-92-203(1) (Cum. Supp. 1984) to include, in pertinent part:

> Water matters [over which water courts have exclusive jurisdiction] include determinations of rights to nontributary ground water outside of designated ground water basins.

S. 439, 44th Gen. Assembly, 1983 Colo. Sess. Laws ch. 516 at 2079. The question as to how the above quoted language, particularly reference to "rights" to non-designated ground water, is to be reconciled with the *Huston* court's concern regarding the recognition of such rights is as yet unanswered. *See supra* note 52.

139. House Joint Resolution No. 1038 (1983) in pertinent part provides:

> That the General Assembly hereby finds and declares that its intention in enacting Senate Bill No. 439, enacted at the First Regular Session of the Fifty-fourth General Assembly, was that its provisions were procedural only, and that the provisions of section 37-90-137(4), Colorado Revised Statutes, shall continue to control the granting of permits for nontributary ground water basins.

H.R.J. Res. 1038, 44th Gen. Assembly, 1983 Colo. Sess. Laws 2125.

Subsequent to the enactment of this legislation, certain parties involved in the *Huston* litigation requested a hearing to argue the legislation's effect on the *Huston* court's ruling.[140] The request for rehearing was denied.[141] However, the Colorado Supreme Court directed that on remand, the water judges were to consider the "applicability, validity, and effect of those legislative enactments and their impact on [the court's] previous determination" that the applications for non-designated ground water be dismissed.[142]

In summary, the law currently governing the removal of non-designated ground water is found in section 37-90-137(4) of the Colorado Revised Statutes.[143] Therein it is provided that the state engineer may issue well permits to non-designated ground water, but that the determination of "water rights"[144] is to be deferred until the source of the desired water is established as a designated basin.[145] Jurisdiction as to review of the state engineer's granting or denial of such a permit in accordance with recent legislation lies in the water court for the county in which the ground water is located.[146]

By leaving the Management Act substantively unchanged, *Huston* impliedly recognizes the purposefulness of the Act and the distinctions therein between designated and non-designated ground water. The postponement of the determination of "rights" to non-designated ground water provides the state engineer time to locate and identify these ground water sources. The Ground Water Commission may then gather the factual and hydrologic data necessary to the establishment of a designated basin.

The alternative allocation systems, as presented and rejected in *Huston*, fail to consider the relevant principles of ground water and would result in a premature designation of permanent rights. Appropriation, prior to the establishment of designated basins, will hamper—or make meaningless—the gathering of factual and hydrologic data necessary to equitably allocate and protect senior rights. Recognition of the private ownership theory improperly presupposes that those who own land overlying non-designated ground water, or those who can afford to buy them out, will put the water to its most beneficial use.

The Management Act, and *Huston*'s approval thereof, ensures a factual basis for the development of permanent ground water management systems. Community users are assured representation in the development of comprehensive plans. Water can be equitably allocated. Senior users can be adequately protected.

In the aftermath of *Huston* and its legislative progeny, certain questions remain. Will the recently enacted legislation withstand judicial

140. *Huston*, 671 P.2d at 1323.
141. *Id.* at 1324.
142. *Id.* at 1323.
143. *See supra* notes 48-52 and accompanying text.
144. *See supra* notes 48-52 and accompanying text.
145. *Id.*
146. *See supra* note 138 and accompanying text.

scrutiny? For example, will there be judicial recognition of "rights" to non-designated ground water? How will the water court respond to the *Huston* remand in light of the new legislation? Until a source of non-designated ground water is established as a designated basis, what "rights" do users and overlying landowners have, and how will conflict between them be resolved? Is the establishment of a designated basin a practical or efficient prerequisite to the determination of the rights to nontributary ground water?[147]

CONCLUSION

Nontributary ground water in Colorado is an anomaly. It is capable of neither common law ownership nor constitutional appropriation. The legislatures and the courts have thus seen fit to incorporate elements of both doctrines into a hybrid "modified" doctrine of appropriation.

The intermingling of theories has raised judicial questions and prompted legislative refinements for over 20 years. There is no reason to believe that this evolutionary process has been truncated by *Huston*. Questions remain unanswered. Conflicts remain unresolved.

It is clear, however, that these questions and conflicts must be approached with an understanding of the principles of the ground water itself, namely, its hydraulics, economics and politics. It is within this context that full economic development, for both the state and user communities, can be achieved in an equitable fashion.

Brett Heckman

147. The Office of the State Engineer, Division of Water Resources, as of March 13, 1984, has located and identified seventeen basins and aquifers containing an estimated 688.6 million acre-feet of non-tributary ground water. As of publication of this article none of these sources have been officially designated or administered in accordance with "designated basin" provisions of the Management Act.